

# COSC 018 – NETWORKS, CROWDS, AND MARKETS

Summer 2021 (July 12 to August 13)

**Instructor:** Ray Essick

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**Office Hours:** By appointment (I am flexible); contact me via email to arrange

**Textbook:** *Networks, Crowds, and Markets: Reasoning About a Highly-Connected World*, David Easley and Jon Kleinberg.

Available online at <http://www.cs.cornell.edu/home/kleinber/networks-book/networks-book.pdf>

Paper copies published by Cambridge University Press (sold on, e.g., Amazon)

## COURSE DESCRIPTION

This course explores the impact of “connectedness” of modern society. Social, technological, and natural interactions can be represented using links in a network formed by people and other entities. This network impacts many phenomena, including the manner in which opinions and epidemics spread through society. This course will explore topics such as spread of opinions, the small-world phenomenon, robustness and fragility of financial markets, and the structure of the Web.

**Prerequisites:** None

## COURSE OBJECTIVES

Students passing this course will be able to ...

1. Understand the basics of graph theory and network analysis.
2. Understand the basics of game theory.
3. Apply both graph theory and game theory to real-world networks and other information systems.

## COURSE OUTLINE

During the course, you’ll complete many different activities

### Discussion Posts

For each chapter/topic we cover, you will contribute to an online discussion post within Canvas. These posts should encourage you to think about the chapter material and relate it to your life and interests (experiences, studies) and to the world out side the class. You’ll also need to read your fellow students’ posts and respond to them.

You’ll earn three points for making a post of your own, and two more for responding to another student (for a total of five points per chapter).

To earn full points, you’ll need to make your post by the end of Thursday (of the week we study the chapter) and reply to another post by the end of Saturday.

### Written homework

Each week, I’ll post a set of questions spanning the chapters/topics covered that week. These problems may ask you to write a short explanation, perform a short calculation, or draw a picture. You’ll need to write answers to these questions and submit them as an electronic (PDF) file to Canvas.

The written homework will be due at the end of Thursday; this lets me provide feedback before the weekly quiz is due.

You may use any software you like to create your submission. A popular choice is the smartphone app CamScanner, which uses your phone's camera as a scanner to convert written work into a PDF.

You are free to discuss these written problems with your classmates, but the final submission should reflect your own solution/wording/work on the problems.

### **Weekly quiz**

Each week, you'll complete a Canvas-based quiz which will have questions drawn from that week's material. You will have one submission attempt for each quiz. They will *not* be timed, so you may work on them until the due date and time. The quizzes will be due at the end of the day on Saturday.

You must work on the quizzes individually; if you have questions about your quiz, you can contact me via email and I will provide clarification.

### **Final exam**

At the end of the semester, there will be a cumulative final exam. This will be provided as a "take home" exam which will be made available for a fixed window of time. You'll complete the exam by writing solutions (either on a printed copy of the exam or your own paper) and uploading your solutions.

Due to the fast-pace of the summer session, the final exam window will likely overlap (at least partially) with the due date for the final quiz. You probably want to plan for some extra time at the end of the course to account for this.

## **GRADING**

Course grades will be determined according to the following weightings:

- Discussion posts (18 total): 20%
- Written homeworks (5 total): 20%
- Weekly quizzes (5 total): 40%
- Final exam: 20%

## **POLICIES**

- I will do my best to respond promptly to any email about the course; please allow 24 hours for a response before sending a follow-up email. To aid in a speedy reply, please put the course number (COSC 018) in your subject line so I can find it quickly.
- Behave civilly in discussions (in-person or online); respect others opinions (even if you disagree with them and/or they are clearly wrong).
- Adhere to the Georgetown Honor System and good academic principles. Submit only your own work done to the best of your ability.

## Academic Integrity

Academic integrity is central to the learning and teaching process. Students are expected to conduct themselves in a manner that will contribute to the maintenance of academic integrity by making all reasonable efforts to prevent the occurrence of academic dishonesty. Academic dishonesty includes (but is not limited to) obtaining or giving aid on an examination, having unauthorized prior knowledge of an examination, doing work for another student, and plagiarism of all types, including looking at or copying another student's code.

Plagiarism is the intentional or unintentional presentation of another person's idea or product as one's own. Plagiarism includes, but is not limited to the following: copying verbatim all or part of another's written work; using phrases, charts, figures, illustrations, code, or mathematical / scientific solutions without citing the source; paraphrasing ideas, conclusions, or research without citing the source; and using all or part of a literary plot, poem, film, musical score, or other artistic product without attributing the work to its creator. Students can avoid unintentional plagiarism by following carefully accepted scholarly practices. Notes taken for papers and research projects should accurately record sources of material to be cited, quoted, paraphrased, or summarized, and papers should acknowledge these sources in footnotes.

In short, do not cheat. Dealing with cheating is by far the worst part of a professor's responsibilities, and it's one that we would greatly like to avoid. **If you are caught cheating, you will be referred to the Honor Council, without exception.** It doesn't matter if you plagiarized one part of one answer in a homework assignment or outsourced your entire semester project to [www.willdoyourprojectforcupcakes.com](http://www.willdoyourprojectforcupcakes.com). Telling us that we're ruining your future/career/life will make us feel wicked bad, but won't stop us from referring you to the Honor Council.

Ignorance of Georgetown's [Standards of Conduct](#) is not an acceptable excuse for academic dishonesty. You are expected to be familiar with and abide by these standards.

Bottom Line: If you are unsure whether something is permissible, ask us beforehand.